(REVISED) APPENDIX - COPY OF ALL PENDING CLAIMS (AS AMENDED)

Rejected Claims on Appeal

2. The method as claimed in 31, wherein said compression is performed in a compression screw device in a range of from 4:1 to 8:1 of the non-compressed volume of said conditioned feed material.

7. The method as claimed in claim 2, wherein said conditioning of said feed material is performed for a period of time in the range of 3-180 seconds.

23. The method of claim 31, wherein the step of preheating is preceded by the steps of

discharging the destructured material into a conveyer at substantially atmospheric pressure;

conveying the discharged material into a storage bin at substantially atmospheric pressure; and

conveying material from the bin by a plug screw feeder through a pressure barrier into a higher pressure environment where said step of preheating is performed.

24. The method of claim 36, wherein the step of preheating is preceded by the steps of

discharging the destructured material into a conveyer at substantially atmospheric pressure;

conveying the discharged material into a storage bin at substantially atmospheric pressure; and

conveying material from the bin by a plug screw feeder through a pressure barrier in to the higher pressure environment where said step of preheating is performed.

25. The method of claim 31, wherein the steps of conditioning and compressing are both performed in a substantially similar environment of saturated steam.

26. The method of claim 31, wherein said saturated steam environment for conditioning and compression is at a saturated pressure corresponding to a temperature no greater than about 120° C and the steps of preheating and conveying the destructured material are performed at a saturated pressure corresponding to a temperature greater than about 120° C.

27. The method of claim 26, wherein the conditioning of said feed material is performed for a period of time in the range of 3-60 seconds.

29. A method for producing thermo-mechanical pulp from lignocellulose fiber-containing chip feed material comprising the steps of:

first conditioning said fiber containing feed material in an environment of saturated steam at a pressure in the range of about 15-25 psi to produce a conditioned feed material;

subsequently compressing said conditioned feed material in a screw press in an environment of saturated steam at a pressure in the range of about 15-25 psi at a compression ratio of at least about 4:1 to destructure said fibers;

subsequent to the step of compressing, preheating the destructured material in an environment of saturated steam; and

immediately following the step of preheating, refining said material to form lignocellulose pulp.

31. A method for producing thermo-mechanical pulp in a primary disc refiner from lignocellulose fiber-containing chip feed material comprising the steps of:

first conditioning said fiber-containing feed material in an environment of saturated steam at an elevated pressure in the range of about 15-25 psi to produce a conditioned feed material;

directly thereafter compressing said conditioned feed material in an environment of saturated steam at an elevated pressure in the range of about 15-25 psi to destructure said fibers without significant breakage across grain boundaries;

pre-heating the destructed material in an environment of saturated steam at a pressure higher than the pressure of the environment at which the material was destructured; and

conveying the pre-heated material to the inlet of a primary disc refiner operating at a higher pressure than the pressure of the environment at which the material was destructured.

32. The method of claim 27, wherein said compression is performed in a compression screw device in the range of from 4:1 to 8:1 of the non compressed volume of said conditioned feed material.

33. The method of claim 31, wherein the conditioning of said feed material is performed for a period of time in the range of 3-60 seconds.

34. The method of claim 31, wherein said step of compressing said conditioned feed material is performed in a variable speed compression screw device in the range of from 4:1 to 8:1 of the non compressed volume of said conditioned feed material.

35. The method of claim 34, wherein the conditioning of said feed material is performed for a period of time in the range of 3-30 seconds.

Allowed Claims

36. A method for producing thermo-mechanical pulp in a primary disc refiner from lignocellulose fiber-containing chip feed material comprising the steps of:

first conditioning said fiber containing feed material while conveyed through a first chamber having an environment of saturated steam at an elevated pressure in the range of about 10-25 psi to produce conditioned feed material;

conveying and compressing the conditioned feed material through a second chamber having an environment of saturated steam at elevated pressure in the range of about 10-25 psi to produce a pretreated material having destructured fibers without significant breakage across grain boundaries;

preheating the pretreated material in a third chamber in an environment of saturated steam at a pressure above 75 psi and above the glass transition temperature of the lignin in the material, for a period of time less than 30 seconds;

conveying the pre-heated material to the inlet of a primary disc refiner operating at a pressure above 75 psi and a temperature above the glass transition temperature of the lignin; and

refining the material at a disc speed of rotation that is greater than 1500 rpm for a double disc refiner or greater than 1800 rpm for a single disc refiner.

37. The method of claim 36, wherein the conditioning of said feed material is performed for a period of time in the range of 3-60 seconds.

38. The method of claim 37, wherein the preheat time period is in the range of about 5-10 seconds.

39. The method of claim 36, wherein the preheat time period is 15 seconds or less.

40. The method of claim 39, wherein the conditioning of said feed material is performed for a period of time in the range of 3-60 seconds.